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Re: Proposed Merged-Stack Stationary Source Permit to Operate Dated December 21, 2007, Mirant Potomac River Generating Station, Alexandria, Virginia

Honorable Board Members, Director Paylor and Mr. Darton:

The City of Alexandria ("Alexandria") appreciates the opportunity to provide comments on the above-referenced merged-stack State Operating Permit ("SOP") for Mirant's Potomac River Generating Station ("PRGS") located in Alexandria, Virginia. As proposed, the SOP allows the PRGS to merge its five existing stacks into two stacks in order to achieve greater dispersion of the facility's emissions into the atmosphere, i.e., it allows construction and operation of the facility under a "merged-stack" or "two-stack" configuration. The SOP contains several crucial deficiencies as discussed in this letter. Alexandria urges the State Air Pollution Control Board ("SAPCB") and Virginia Department of Environmental Quality ("VDEQ") to resolve them prior to giving any further consideration to the two-stack SOP. Several of these deficiencies are the same that Alexandria has previously pointed out, including those in its comments on the

proposed five-stack SOP dated October 19, 2007, and that have remained unresolved in the proposed two-stack SOP. On January 14, 2008, in a letter to the SAPCB and VDEQ, Alexandria provided copies of guidance documents from several states along with examples of recent permit actions incorporating NAAQS-compliant $PM_{2.5}$ emission limits. This letter along with another letter that the City submitted to the Board and VDEQ on January 25, 2008 are an integral part of the City's comments on this proposed two-stack SOP.

Summary of Alexandria's Comments

1. The merged-stack SOP is deficient without resolution of New Source Review ("NSR") applicability. VDEQ must document and share its findings on the NSR applicability analyses for the PRGS, including representative baseline and future emissions calculations. This includes (1) past NSR violations for LNB, SOFA and trona installations, (2) emission increases due to the stack merger project, (3) increase in the maximum heat input rates as compared to the rated capacities as listed in PRGS's current SOP, and (4) use of an alternate sorbent other than trona.

2. The SOP is not comprehensive because it does not specify any $PM_{2.5}$ or mercury limits. It is imperative that impacts of $PM_{2.5}$ emissions from the PRGS be assessed and $PM_{2.5}$ NAAQS-compliant emission limits be established in the permit. Condition 37 of the proposed SOP must be removed and a $PM_{2.5}$ ambient air quality analysis must be performed using tools and guidance already available for this purpose. Similarly, mercury limits must comply with VDEQ's Significant Ambient Air Concentration ("SAAC") guidelines and reflect the upcoming Clean Air Mercury Rule ("CAMR").

3. Based on optimized operation of the source and the pollution control measures, compliance with the NAAQS and SAAC, and NSR avoidance the limits in the SOP must not exceed the following:

SO_2	< 0.30 lb/MMBtu	(trona optimization)[1]
NOx	< 0.22 lb/MMBtu	(LNB/SOFA optimization)
PM	< 0.03 lb/MMBtu	(ESP performance)
PM_{10}	< 0.02 lb/MMBtu	(ESP performance)
$PM_{2.5}$	< 0.003 - 0.012 lb/MMBtu	(NAAQS compliance)
CO	< 0.20 lb/MMBtu	(BACT)
Hg	< 37 lb/yr	(actual baseline emissions)
Coal sulfur	< 0.9 wt%	(current limit for PRGS)

4. Short term (hourly and daily) emissions are arbitrary and unreasonable, and allow PRGS to take credit for an illegal dispersion technique. They must be revised to reflect actual

[1] Should PRGS seek approval of an alternate sorbent, the SO_2 emission rate must reflect the performance of the new sorbent. Also, NSR applicability and a robust evaluation of the alternate sorbent must be performed, including its effect on ESP performance, PM_{10} and $PM_{2.5}$ emissions, and SO_2 and acid gas reductions.

performance and operations at the PRGS, and must be based on NAAQS compliance achieved without the benefit of stack merger.

5. Annual emissions must not exceed baseline emissions during the most recent 24 month period, i.e., fall 2005 through fall 2007. For PM_{10} and $PM_{2.5}$, the annual average baseline emissions for the period of October, 2005 through September, 2007 are estimated using stack test data to be 137 and 117 tons/year, respectively. Please note that even the $PM_{2.5}$ annual limit of 117 tons/year does not insure compliance with the annual $PM_{2.5}$ NAAQS.

6. Baghouses must be required on all five boilers at the PRGS.

7. CEMS for CO and PM must be required on all five boilers as soon as possible. The PM_{10} and $PM_{2.5}$ fractions identified during the stack tests required by the SOP must be used in conjunction with the PM CEMS data for continuous compliance purposes.

8. Use of a sorbent other than trona for SO_2 emissions control must not be pre-authorized in the SOP, but only allowed after a robust evaluation, including its effect on ESP performance and the ash handling system, a documentation of particle size distribution and chemical properties of the sorbent as injected, a complete stack test for *every boiler* showing pre- and post-ESP as well as pre- and post-sorbent emissions of SO_2, PM_{10}, $PM_{2.5}$ and acid gases, evaluation of NSR applicability, and issuance of a pre-construction permit.

9. The SOP must be practically enforceable and require adequate monitoring, recordkeeping and reporting requirements as follows:

    a. Heat input rates must be enforceable. Coal firing rates and trona feed rates (tons/hr) must be recorded for each boiler.
    b. Stack tests for PM_{10} and $PM_{2.5}$ must be required every six months for the first two years. Upon demonstration of continuous compliance, the staggered schedule for boiler stack tests in Condition 36 of the proposed SOP may be followed.
    c. Emission limits that apply during all operating scenarios must be specified. Multiple operating scenarios with different limits represent intermittent controls and compliance determination under multiple scenarios is cumbersome.
    d. All plant data, including monitoring and testing records, must be made available to the public in a readily-accessible manner without the need for a FOIA request.

10. Limits and compliance requirements of CAIR and CAMR, which will take effect soon after the SOP is issued, must be identified in the SOP.

The following sections provide more detailed discussions, and technical and regulatory justifications for the above comments.

I. **The Two-Stack SOP is Deficient**

On September 13, 2007, the SAPCB determined that a NSR pre-construction permit is required for the stack merger project based on the emissions levels that PRGS requested in its Form 7 application submitted to VDEQ. The Board also considered another permitting option, the synthetic minor permit, to allow PRGS to avoid NSR by accepting emission limits that are no more than its baseline emissions, plus an "insignificant" increase that is lower than the limit that would trigger a minor NSR. However, in order to provide this exemption to PRGS, an appropriate baseline must be established. The proposed SOP fails to limit PRGS's emissions to an appropriate baseline level required under VDEQ regulations.

Stack Merger Has the Potential to Increase Emissions

The proposed two-stack SOP contains annual emission limits for the PRGS. With the exception of SO_2, a comparison of these future emissions with the appropriate baseline represents an increase that is subject to review under Virginia's NSR regulations. For example, the table below shows that the increase in emissions of NOx and PM_{10} is sufficient to trigger the need for a major NSR permit. While the SOP does not specify a $PM_{2.5}$ emission limit, the PM_{10} emission limit indicates that there would also be a significant increase in $PM_{2.5}$ emissions. Unless VDEQ establishes permit limits that restrict future emissions to the baseline emissions, plus an increase that is less than "significant" as defined in 9 VAC 5-80-1615, a major NSR permit would be required, possibly establishing stringent pollution control requirements. Given that the Washington, D.C. metropolitan region is a $PM_{2.5}$ nonattainment area, a major NSR analysis for $PM_{2.5}$ would require the application of LAER. 9 VAC 5, Chapter 80, Article 9. The determination of LAER would likely require the installation of baghouses in order to meet the limit.[3]

Comparison of Baseline and Future Emissions

Pollutant	Baseline Emissions(1) (tons/yr)	Proposed Future Emissions (tons/yr)	Net Emissions Increase (tons/yr)
SO_2	3,813(2)	3,813	0
NOx	1,904	3,700	1,796
PM_{10}	137 (3)	377	240
$PM_{2.5}$	117 (3)	(4)	(4)

(1) Based on 24 months of available data from Oct, 2005 through Sept, 2007. The average annual heat input during this period was 14,675,115 MMBtu/yr.
(2) The SO_2 emissions limit of 3,813 tons/yr was established in the SOP issued to PRGS on June 1, 2007.
(3) Based on the highest PM-10 stack test result of 0.0186 lb/MMBtu (Dec 2005 stack test), and the highest $PM_{2.5}$-to-PM_{10} ratio of 0.86 (Dec 2006 stack test).
(4) The proposed SOP does not specify a $PM_{2.5}$ emissions limit. However, the specified PM_{10} limit indicates that a significant increase in $PM_{2.5}$ emissions is very likely.

[3] Optimizing the trona injection system to maximize SO_2 control likely requires greater use of trona thereby resulting in greater particulate matter emissions from the boiler stacks. The installation of a baghouse will have the dual benefit of controlling particulate matter as well as providing greater reaction time for trona to control SO_2 and acid gas emissions.

The stack merger project will require the installation of larger induced draft (I.D.) fans. The current I.D. fans in all five boilers were installed at the time of original construction and are therefore more than 50 years old. As a part of its NSR analysis, VDEQ must evaluate whether the new I.D. fans would have the effect of increasing plant availability and reducing forced outages. Any increase in plant availability will have a direct bearing on an increase in annual emissions.

The installation of larger I.D. fans has the potential to draw a greater volume of air through the system. A greater flow rate, while serving the purpose of greater exhaust velocity through the stack, will result in smaller residence time for both trona and ESP controls, thereby increasing emissions of SO_2, PM_{10} and $PM_{2.5}$. Therefore, any fan capacity beyond that necessary to overcome the head loss due to stack merger must be carefully evaluated.

Review of PRGS' operational records for Boiler No. 1 show heat input, flow rate, and NOx and SO_2 emissions that are two or more times the design and expected emissions for several periods during 2005 and 2006. These records deserve close review for their relationship to possible debottlenecking of boiler capacity due to increased fan capacity.

The Past 24 Months of Emissions is the Most Appropriate Baseline

In conducting the NSR analysis, VDEQ must define baseline actual emissions from the PRGS for all regulated NSR pollutants, including SO_2, NOx, CO, VOC, PM_{10} and $PM_{2.5}$. VDEQ regulations define baseline actual emissions as the actual tons-per-year emissions during any 24-month period out of the previous five years, except that any noncompliant emissions must be excluded from the baseline. 9 VAC 5-80-1615. Given that Mirant's modeling analysis prepared in August 2005 demonstrated noncompliance with the National Ambient Air Quality Standards (NAAQS), only emissions from the most recent 24 months can be considered as baseline.

The table presented above is based on 24 months of actual emissions available for the period of October, 2005 through September, 2007. Any increase in emissions above this baseline must be evaluated against major NSR thresholds.

Past NSR Violations Must be Resolved

The proposed stack merger project is the latest in a series of physical modifications at the PRGS. Mirant has recently completed the installations of low-NOx burners (LNB) on all five boilers, separated overfire air (SOFA) technology on three boilers, and trona injection on all five boilers. All of these modifications were made without applying for or receiving a permit from the VDEQ. Alexandria believes that these projects resulted in emissions increases of one or more criteria pollutants. For example, LNB and SOFA are known to cause CO emissions increases according to a paper published by Mirant and its LNB vendor[4]). Similarly, as the opacity and CO emissions data presented below shows, trona injection very likely resulted in increases of PM_{10}, $PM_{2.5}$ and CO emissions from the boiler stacks. Additionally, particulate matter emissions increased from the ash handling operations due to larger quantities of ash produced from trona

[4] Walcutt, G., Mirant PRGS, et al., **CCA** COMBUSTION COMPONENTS ASSOCIATES 884 MAIN STREET, MONROE, CT 06468 TEL (203)268-3139

use. Because these projects were completed within the past five years, they are considered to be contemporaneous with the proposed stack merger project. 9 VAC 5-80-1615.

Average Stack Opacity With and Without Trona Use

Boiler	Average Opacity[1]		% Increase in Opacity
	Pre-Trona (Jun-Aug 2005)	Post-Trona (Jun-Aug 2006)	
1	2.86	6.03	110.8%
2	4.16	6.76	62.5%
3	3.62	3.74	3.3%
4	2.61	3.10	18.7%
5	2.55	4.10	60.8%

(1) Based on a summary of 20,000 data points reported by Mirant for stack opacity, which is a surrogate for particulate matter emissions.

Carbon Monoxide Emissions With and Without Trona Use

Boiler	CO Emissions (ppm) [1]		% Increase in CO Emissions
	Trona OFF	Trona ON	
3	Run 2 359	Run 1 1,019	
3	Run 3 481	Run 4 429	
3	Run 6 258	Run 5 485	
Average	**366**	**644**	**76%**

(1) CO emissions data from Mirant's stack test report of December 2006 for Boiler No. 3. Using the average rate of 644 ppm, and assuming 60% boiler operation at 1,000 MMBtu/hr average boiler capacity, the annual CO emissions would be 1,750 tons per year from Boiler No. 3 alone, compared to about 250 tons per year that Mirant has reported as plantwide CO emissions for the past several years.

Alexandria understands that VDEQ has evaluated NSR applicability to past projects at the PRGS, and requests that VDEQ publicly disclose the findings of their review and any conclusions drawn from that evaluation.

Neighboring Jurisdictions Must be Notified

Under VDEQ regulations, a complete NSR analysis requires that the neighboring jurisdictions, i.e., State of Maryland and District of Columbia, be provided an opportunity to review the proposed stack merger project. 9 VAC 5-80-2110. The PRGS contributes to nonattainment of ozone and $PM_{2.5}$ NAAQS in the Washington, D.C. metropolitan area. By constructing the stack merger project, it is most likely that PRGS will cause a greater contribution to the nonattainment in the neighboring jurisdictions. Alexandria requests the SAPCB and VDEQ that these neighboring jurisdictions be notified of the proposed project along with pertinent data necessary for their review and comment.

II. The Proposed SOP is Not Comprehensive

The proposed two-stack SOP fails to establish any limits on $PM_{2.5}$ and mercury emissions. This is a serious deficiency and does not satisfy VDEQ's commitment to issue a comprehensive SOP to the facility. Alexandria requests that emissions limits for both of these pollutants be specified using methods described below.

III. $PM_{2.5}$ Impacts Must be Assessed

The proposed two-stack SOP fails to establish any $PM_{2.5}$ emission limits, let alone limits that would comply with the $PM_{2.5}$ NAAQS. Alexandria has previously provided comments to VDEQ regarding the need to evaluate $PM_{2.5}$ emissions from the PRGS. $PM_{2.5}$ is of primary interest to the residents of Alexandria and its emissions from PRGS were initially raised as a concern in 2005. It is a regulated criteria pollutant for which the NAAQS have been established.

Alexandria's comments herein focus mainly on the direct component of this facility's $PM_{2.5}$ impacts, i.e., its primary components, as defined by US EPA to mean "*solid particles emitted from an air emissions source or activity, or gaseous emissions or liquid droplets from an air emissions source or activity which condense to form particulate matter at ambient temperatures.*" Results of air quality modeling of each of the primary and secondary components of $PM_{2.5}$ indicate that a focus on strictly the primary $PM_{2.5}$ impacts at close-in locations, for the immediate purposes of this SOP, will provide substantial assurance that this facility's total $PM_{2.5}$ impacts at close-in distances comply with Virginia's $PM_{2.5}$ standards.[5] The PRGS's impacts due to its indirect, i.e., secondary, components on regional levels of $PM_{2.5}$ also fall under the responsibility of the facility's owner/operators. However, these can be addressed within Virginia's forthcoming regional $PM_{2.5}$ attainment plans.

Regulatory Requirement

Virginia regulations at 9 VAC 5-30 include $PM_{2.5}$ within the definition of primary ambient air quality standards (AAQS). A primary AAQS defines the level of air quality which, allowing an adequate margin of safety, is necessary to protect public health. Virginia's 9 VAC 5-80-1180.A.3 prohibits the issuance of a permit unless the facility has been "*designed, built and equipped to operate without preventing or interfering with the attainment or maintenance of any ambient air quality standard (AAQS) and without causing or exacerbating a violation of any applicable ambient air quality standard.*" Furthermore, U.S. EPA has documented its support for the protection of all NAAQS when it stated that it "*will not support any continued full or partial operation of the Potomac River without verification from EPA experts that there will not be any modeled exceedances of the NAAQS caused by emissions from the plant*." Letter from Donald S. Welsh, U.S. EPA Region III, to James P. Moran, U.S. Congress, October 21, 2005.

$PM_{2.5}$ SIP Development

The Metropolitan Washington Air Quality Committee ("MWAQC") and VDEQ are currently in the process of developing the State Implementation Plan ("SIP") to address $PM_{2.5}$ nonattainment

[5] "CALPUFF Model Runs," Sullivan Environmental Consulting, April 2007

in the metropolitan Washington area, which includes the City of Alexandria. As a part of the SIP development, VDEQ must address any "hot spots" within the nonattainment area. The PRGS is the single largest source of primary and secondary $PM_{2.5}$ emissions located within the nonattainment area of Northern Virginia. Dispersion modeling to date demonstrates that a "hot spot" exists in the area surrounding the facility and that the PRGS contributes significantly to the nonattainment in Alexandria and metropolitan Washington. Absent the resolution of this "hot spot," any SIP developed by MWAQC and VDEQ would be inadequate.

It is important to note that EPA's Clean Air Act Scientific Advisory Committee ("CASAC") recommended[6] that the annual $PM_{2.5}$ NAAQS be lowered to 13-14 $\mu g/m^3$, as compared to the current NAAQS of 15 $\mu g/m^3$. Based on this recommendation by CASAC, and the growing evidence of $PM_{2.5}$-related health effects, the MWAQC decided to continue the development of the SIP and submit it by the April 2008 due date despite recent data that shows marginal compliance with the annual NAAQS. Indeed, VDEQ is currently accepting public comments on the draft SIP that it recently proposed. Under the SIP, it is expected that compliance determination would be based on data from the years 2007, 2008 and 2009. Therefore, this is the most appropriate time for VDEQ to address PRGS's compliance with the $PM_{2.5}$ NAAQS and resolve the "hot spot" around PRGS.

VDEQ has previously indicated that the SIP will address the unresolved issue of $PM_{2.5}$ impacts from PRGS. However, the absence of any emission limits in the proposed two-stack SOP appears to run counter to the goal of achieving attainment. Dispersion modeling of PRGS's primary $PM_{2.5}$ emissions conducted by Alexandria shows that PRGS will cause egregious violations of the NAAQS. Alexandria urges VDEQ to immediately address primary impacts of $PM_{2.5}$ in the local area within this SOP proceeding, as we describe here, yet also include an analysis of PRGS's $PM_{2.5}$ precursor emissions in the SIP and propose measures necessary to minimize these emissions to help achieve the ultimate goal of regional attainment. Local-scale NAAQS attainment, while statutorily required, can only propitiously serve the SIP for regional attainment.

VDEQ's current approach of using PM_{10} as a surrogate for addressing $PM_{2.5}$ impacts is simply inadequate given the nonattainment status of the region. There is ample guidance, as well as state-of-the-art tools, currently available (see discussions below) to address $PM_{2.5}$ emissions independently of PM_{10}. The long-term health of the citizens living in Northern Virginia should not be further compromised by the timing of the promulgation of EPA's guidance. VDEQ must adopt a proactive, and not a reactive, approach to addressing this issue. One such approach would be for VDEQ to establish significant impact levels ("SILs") for $PM_{2.5}$ and to apply these SILs for evaluating modeled impacts in the area surrounding the PRGS, as several other states have done. Furthermore, if the PM_{10}-as-surrogate approach were to be used correctly, the PM_{10} impacts from PRGS should have been compared to the PM_{10} SILs for this nonattainment area, and NOT to the PM_{10} NAAQS as VDEQ has done for this proposed permit.

Modeling Tools are Available Now

Dispersion models described in U.S. EPA modeling guidelines are available now for modeling $PM_{2.5}$ emissions. Specifically, AERMOD is capable of modeling primary $PM_{2.5}$ emissions for

[6] Letter dated September 29, 2006 from CASAC to EPA Administrator Stephen Johnson (EPA-CASAC-LTR-06-003)

local impacts, and CALPUFF can model both primary and secondary $PM_{2.5}$ emissions for impacts on regional receptors. These are the current state-of-the-art models and are well-suited for application at the PRGS. U.S. EPA has no plans to develop any new dispersion models for estimating $PM_{2.5}$ impacts. Any future modeling analysis conducted for PRGS would most likely use one or both of these models. Therefore, Alexandria does not believe there is any reason to delay $PM_{2.5}$ modeling. On the contrary, any deferral of this analysis would only delay the eventual discovery of NAAQS violations in the same manner as the much-delayed discovery of other NAAQS violations in 2005. Alexandria urges the SAPCB and VDEQ to require $PM_{2.5}$ modeling as a part of both the issuance of this SOP as well as the SIP development.

Ambient monitoring alone is inadequate to establish NAAQS compliance for PRGS and cannot substitute for modeling. Dispersion modeling evaluates ambient impacts on a comprehensive receptor grid, while monitoring can only provide limited coverage. Therefore, all NAAQS compliance, including compliance for the limits in SOP and any future compliance determination, must be based on dispersion modeling.

Federal Guidance Supports $PM_{2.5}$ Modeling

Some states have adopted the policy described in EPA's Stephen D. Page memorandum[7] that describes a PM_{10}-as-surrogate approach for federal New Source Review ("NSR") proceedings. However, it is important to note, as the memorandum itself declares, that the "*statements in [that] policy guidance do not bind Sate and local governments and the public as a matter of law*." Furthermore, this PM_{10}-as-surrogate approach lacks any specificity in the procedures to protect the $PM_{2.5}$ NAAQS, as is required, through an air quality compliance demonstration. Extrapolation of the Page memorandum's guidance to an air quality compliance demonstration, as VDEQ has done to date, has resulted in a proposed SOP that will allow PRGS's emissions to cause or contribution to a NAAQS violation for $PM_{2.5}$, a contravention of Virginia regulations.

Several federal rules pertaining to $PM_{2.5}$ maintenance and attainment procedures that are more recent in their issuance than the Page memorandum provide support for permitting action that protects the $PM_{2.5}$ NAAQS through an air quality compliance demonstration which is specific to $PM_{2.5}$. First, the Clean Air Fine Particle Implementation Rule, which became final on April 25, 2007, states that upon "*promulgation of this final rule, the EPA will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information given that* ***both pollutants are regulated by a National Ambient Air Quality Standard and are therefore considered regulated air pollutants"*** (emphasis added). Additionally, EPA's proposed rule for Prevention of Significant Deterioration for $PM_{2.5}$[8] proposes three different levels of significant impact levels, i.e., thresholds designed specifically to address the $PM_{2.5}$ NAAQS, to which a $PM_{2.5}$ source's impacts can be limited in order to demonstrate that its impacts will not cause or

[7] "Implementation of New Source Review Requirements in PM-2.5 Nonattainment Areas," Stephen D. Page, April 5, 2005 (available at http://www.epa.gov/oar/nsr/documents/nsrmemo.pdf)

[8] Federal Register, September 21, 2007, 40 CFR Parts 51 and 52, Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$) – Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule.

contribute to a violation of the $PM_{2.5}$ standards. **The above EPA rule basically makes its previous guidance on using PM_{10} as a surrogate to $PM_{2.5}$ invalid.**

The table below shows several federal guidance documents which imply or explicitly describe the acceptability of application of a Gaussian dispersion model such as AERMOD to estimate a facility's local-scale impacts of primary $PM_{2.5}$.

EPA Guidance Documents Acknowledging the Acceptability of a Gaussian Model for Determining Primary $PM_{2.5}$ Impacts from Sources

Document	Guidance
Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$)—Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule (1)	"*We have also provided approved air quality models and guidelines for sources to use to project the air quality impact of each pollutant (over each averaging period)…*" US EPA's Guideline on Air Quality Models is referenced, which includes AERMOD as a recommended model.
Appendix B - Local-Scale Assessment of Primary $PM_{2.5}$ for Three Urban Areas(2)	AERMOD is applied in "*[l]ocal-scale air quality modeling …to examine the spatial variability of direct $PM_{2.5}$ concentrations associated with emissions of primary $PM_{2.5}$…*"
Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze(3)	"*…while dispersion models may not be an appropriate tool for determining secondary $PM_{2.5}$ concentrations, they work well for use in determining local primary $PM_{2.5}$ impacts in a small area.*"

(1) Federal Register (72 FR 54111): http://www.epa.gov/fedrgstr/EPA-AIR/2007/September/Day-21/a18346.pdf
(2) EPA's Support Center for Regulatory Atmospheric Modeling: http://www.epa.gov/scram001/modelingapps_disp.htm
(3) EPA's Support Center for Regulatory Atmospheric Modeling: http://www.epa.gov/scram001/guidance_sip.htm

Modeling Requirements of Other States

Several states have adopted policies for $PM_{2.5}$ permitting that agree with Alexandria's approach. In several of these states, permit applications have been processed under these policies, and permits stipulating $PM_{2.5}$ emission limitations have been issued. Correspondence with these states is summarized in the table below.

Guidance from States Requiring $PM_{2.5}$ Modeling

State	Elements of $PM_{2.5}$ Permitting Procedures	Comments
Connecticut[1]	• SILs of 0.3 µg/m^3 (annual) and 2.0 µg/m^3 (24-hr) • Background based on 3-yr averages of annual and 98th percentile 24-hour values from existing $PM_{2.5}$ network • Modeled 3-yr average of maximum 8th highest 24-hr and annual values added to background and compared to $PM_{2.5}$ NAAQS	"AREMOD [sic] has been run and used to demonstrate compliance with the new interim $PM_{2.5}$ policy in a couple of cases so far." Permits, if issued yet, would "contain a $PM_{2.5}$ specific emission limitation."
New Jersey[2]	• SILs of 0.3 µg/m^3 (annual) and 2.0 µg/m^3 (24-hr) • Only direct $PM_{2.5}$ emissions addressed • Must reduce impacts below the SIL if violation of $PM_{2.5}$ NAAQS is predicted	Several permit proceedings have abided by written policy to date, and agency has stipulated $PM_{2.5}$ limits within several permits.
New York[3]	• SILs of 0.3 µg/m^3 (annual) and 5.0 µg/m^3 (24-hr) • Requires applicant to demonstrate compliance for both primary and secondary components • Air quality analysis must provide expected contribution to annual and 24-hour ambient concentrations	Policy has been implemented.
Michigan[4] **Pennsylvania** [5]	• SILs of 5.0 µg/m^3 (24-hr)	Sources obtaining permits are complying with $PM_{2.5}$ standard by demonstrating that their impacts are below the specified SIL for $PM_{2.5}$

(1) Correspondence with J. Catalano, CT DEP, Nov. 7, 2007
(2) Correspondence with Gregory John, NJ DEP, Nov. 5, 2007
(3) Correspondence with Bob Gaza, NYSDEC, Nov. 1, 2007
(4) Correspondence with James Haywood, Senior Meteorologist, relayed by Lori Myott, Senior Engineer, MI DEQ, Nov. 9 and Nov. 15, 2007
(5) Correspondence with Mr. Yunger, PA DEP, Jul. 18, 2007

$PM_{2.5}$ Emissions from PRGS are Not NAAQS-Protective

Alexandria has applied AERMOD to calculate $PM_{2.5}$ impacts from this facility in the same manner as applied for PRGS's other criteria pollutants, i.e., PM_{10}, CO, NOx and SO_2. Even assuming stack emissions that are equivalent to a level that can be achieved by this facility's ESPs, results show that the impacts contribute to severe exceedances of the $PM_{2.5}$ NAAQS.

Despite VDEQ's commitment to address this pollutant and despite the availability of the models necessary to estimate $PM_{2.5}$ impacts in the ambient air, no such analysis has been conducted to date. At the least, Alexandria requests that primary $PM_{2.5}$ emissions, including filterable and condensable components, should be quantified and modeled, and appropriate emission limits should be established in the SOP. Alexandria's modeling results demonstrate egregious violations of the $PM_{2.5}$ NAAQS for the proposed operations. The following table shows the modeled 24-hour average impacts due to primary $PM_{2.5}$ stack emissions alone for some of the operating scenarios. Since dispersion credit is not granted to PRGS for $PM_{2.5}$, these modeling results reflect the current five-stack configuration.

Merged Stack Configuration –PM $_{2.5}$ ($\mu g/m_3$) Impacts for One of Worst-case Operational Scenarios

	24-hour	Annual
Stack Impacts on Elevated Receptors[1]: 3-year avg. of 8th-highest, stacks alone, among all Marina Towers rooftop receptors.	6.5	0.9
Coal and Ash Yard Impacts on Ground-level Receptors[2]**:** 3-year avg. of 8th highest, ground-level, from coal and ash yard sources only.	8.2	2.6
Background[3] 3-year avg. of 8th-highest, closest monitor.	34.1	14.1
Maximum Total PM2.5 Impact	42.3	16.7
NAAQS	***35***	***15***

(1) For five years of modeling (2001, 2003-2006) of primary stack emissions, assuming $PM_{2.5}$ emissions are equal to the rate allowed by the SOP, i.e., 0.030 lb/MMBtu. The listed 24-hour impact is the highest of the 3-year averages of eighth-highest (98th percentile) modeled values among receptors on Marina Tower, and the annual impact is the highest 3-consecutive-year average, from AERMOD modeling using Mirant's modeling files for Case 1D, as posted on VDEQ's ftp site with no change, except to allow calculation of the 8th highest impacts and to reflect the SOP's allowed $PM_{2.5}$ emission rates for stacks and coal and ash yard sources. All coal and ash yard emission rates reflect scaling of PM_{10} rates of between 0.25 and 0.15.

(2) Highest 3-year average based at any one ground-level receptor.

(3) The 24-hr value is the 3-year average of the 8th highest daily observations, and the annual value is the 3-year average, for years 2004 – 2006 from VDEQ's Aurora Hills monitor. Data provided by Mr. Michael Kiss of VDEQ.

Even without the inclusion of (1) the effect of secondary $PM_{2.5}$ formation due to precursor emissions from PRGS, and (2) $PM_{2.5}$ emissions from other nearby interacting sources, the predicted impacts far exceed the NAAQS. These high impacts require scrutiny by the SAPCB and an analysis of pollution control and impact mitigation measures. Given the high impacts, primary $PM_{2.5}$ emissions from each boiler must be reduced to a level much lower than 0.01 lb/MMBtu in order to demonstrate NAAQS compliance.

The table below shows the calculated $PM_{2.5}$ emission rates at which the PRGS's boilers will not cause or contribute to an exceedance of the NAAQS, i.e., the impacts at these emission rates will be below the $PM_{2.5}$ SILs proposed by U.S. EPA (September 21, 2007). AERMOD results for $PM_{2.5}$ indicate that compliance with the 24-hour NAAQS will substantially assure compliance with the annual NAAQS.

Calculated $PM_{2.5}$ Emission Limits for Stacks Necessary for NAAQS Compliance

Averaging Period	Proposed SOP Limit (lb/MMBtu)	Modeled $PM_{2.5}$ Impact at Proposed SOP Limit(1) ($\mu g/m^3$)	U.S. EPA's Proposed $PM_{2.5}$ SILs ($\mu g/m^3$)	Calculated $PM_{2.5}$ Limit for Impacts to be Below SIL (lb/MMBtu)
24-hr	0.030	6.5	5.0	0.20
			4.0	0.018
			1.2	0.006
Annual		0.9	1.0	0.030
			0.8	0.013 0.027
			0.3	0.010

(1) Results for "1D" case, i.e., assuming all five boilers running at mid load for 24 hours per day. Other scenarios must be evaluated to identify the worst-case impacts.

Alexandria believes that installation of baghouses, possibly combined with some operational restrictions at PRGS, will reduce $PM_{2.5}$ emissions to a level necessary for NAAQS compliance. In the absence of baghouses, substantial curtailment of operations is required. Therefore, it is evident that the proposed SOP must include stringent $PM_{2.5}$ emission limitations for all boilers.

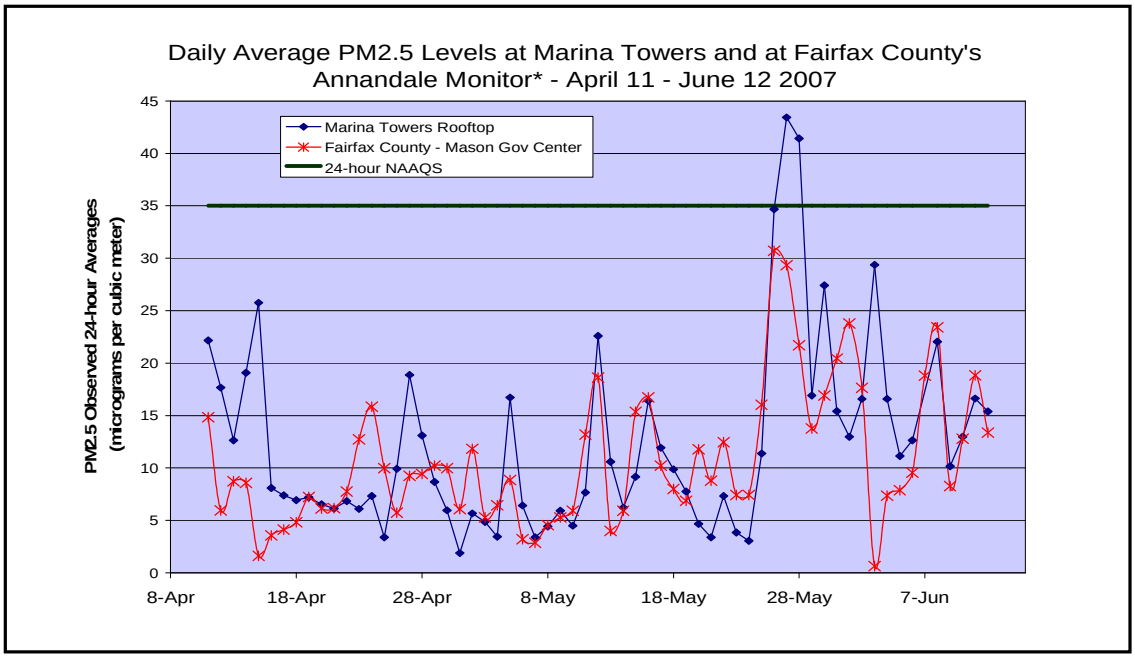
Impacts of Fugitive Emissions

Alexandria's analysis of AERMOD results for fugitive sources indicate that maximum impacts from the coal and ash yard sources contribute to $PM_{2.5}$ impacts in exceedance of the PM2.5 NAAQS at low-level receptors, even without consideration of impacts from diesel engines' emissions of truck traffic from ash hauling, which are also PRGS's responsibility to control and mitigate if necessary. The impacts from the fugitive sources should be fully evaluated within the $PM_{2.5}$ impacts assessment, just as the facility's PM_{10} analysis has done to date. Potential mitigation measures for coal and ash yard sources include (1) full enclosure maintained under negative pressure for the ash unloading operations, or as an alternate, a fully enclosed pneumatic system for ash handling, (2) reducing the footprint of the coal pile to that modeled by Mirant and limiting the height of the coal pile to no more than the height of the screen fence, and (3) particulate matter traps on mobile source exhausts, when these are included. The emission problems with the ash unloading operations have been evident on a routine basis at the PRGS, including during a recent VDEQ inspection on October 4, 2007 in which the inspectors "*observed a large plume of fugitive dust emissions escaping from the ash unloading area*."

Fugitive emissions from ash handling operations have increased since the trona injection system was installed at the PRGS. At 0.9% sulfur in coal and trona use rate at a stoichiometric ratio of 3.0, Alexandria estimates that an additional 8.5 lb/MMBtu of ash is produced from trona alone compared to about 8 lb/MMBtu of ash from the coal. Consequently, the amount of ash produced by PRGS has more than doubled due to trona use. The watering system currently in use during ash unloading is simply inadequate to control the amount of fugitive dust generated. An enclosure with negative pressure or pneumatic handling of ash is necessary for this operation.

Alexandria's Monitoring Results

Alexandria has also collected several months of ambient $PM_{2.5}$ data at the roof of Marina Towers during 2007. The following chart is a summary of the monitored concentrations, along with simultaneous data from regional monitors. In addition, the table below shows more detailed monitoring data during three days in May 2007 when concentrations at Marina Towers approached or exceeded NAAQS. The data shows that concentrations at Marina Towers often exceed the regional values and in some cases exceed the NAAQS level. These data further enforce the need to evaluate and mitigate $PM_{2.5}$ impacts from the PRGS.



Monitor Location		Daily Average PM2.5 Levels (µg/m^3) (NAAQS = 35 µg/m^3)		
		May 26, 2007	**May 27, 2007**	**May 28, 2007**
Arlington Co. FRM1	S. 18th and Hayes St.	--	29.5	--
Arlington Co. FRM2	S. 18th and Hayes St.	--	29.8	
Franconia	Lee Park, Telegraph Rd	29.9	25.0	16.0
Annandale (Fairfax Co.)	6507 Columbia Pike	--	29.5	--
Annandale (Fairfax Co.)	6507 Columbia Pike	30.7	29.3	21.7
McLean	1437 Balls Hill Road	--	25.9	
Ashburn	38-1 Broad Run HS	--	24	--
Marina Towers	**Rooftop**	**34.7**	**43.4**	**41.4**

Baghouses are Required to Adequately Control PM Emissions

The overwhelming evidence of PRGS's high impacts and the preponderance of data linking $PM_{2.5}$ to serious health effects, up to and including premature deaths, require the SAPCB and VDEQ to take a proactive stance towards minimizing emissions from this facility and mitigating the adverse impacts. Beyond the available regulatory framework, the SAPCB also has the general duty to protect public health and is authorized to use discretion in the interest of protecting public health and the environment. In a permitting action such as the issuance of this SOP, Virginia law at Title 10.2, § 1307.E, authorizes the SAPCB to consider the threat caused by any activity due to the "*character and degree of injury to, or interference with, safety, health, or the reasonable use of property*" and the "*scientific and economic practicality of reducing or eliminating the discharge resulting from such activity*" and balance it with the "*social and*

economic value of the activity." Alexandria urges the SAPCB to use its discretionary authority to critically evaluate these health effects and mandate the reduction of particulate matter emissions from PRGS. The harm cause by PRGS is significant, and exacerbated by the intense residential development around the plant, while the value of the plant's service is diminished from that period when Washington D.C. relied on its output to meet energy reliability needs. Given that it is feasible and practical to control and monitor $PM_{2.5}$ emissions from the PRGS, Alexandria requests that the SAPCB exercise a broad scope of review in this permitting action.

Analysis conducted by Alexandria to date shows that baghouses are necessary on all five boilers in order to mitigate the adverse health-related impacts from PRGS. Alexandria believes that this is the only way for the PRGS to reduce its particulate matter emissions sufficiently to comply with NAAQS and alleviate the health impacts. Alexandria also believes that baghouses would have likely been required if PRGS had properly applied the major NSR regulations and secured a construction permit prior to the installation of the trona injection system. Alexandria requests the SAPCB to earnestly consider the benefits of baghouse installation at PRGS. Not only will baghouses reduce particulate matter emissions, they will enhance the performance of trona in reducing SO_2 and acid gas emissions, and will also aid in the reduction of mercury emissions. Baghouses will also help shave the peak 5-minute SO_2 concentrations at nearby receptors, which is a concern that led the Agency for Toxic Substances and Disease Registry ("ATSDR") to conduct an ambient monitoring study in the area surrounding the PRGS. The benefits of this multi-pollutant control far exceed the cost of the baghouses.

IV. **No Dispersion Credit Must be Allowed for Stack Merger**

The purpose of the stack merger project is strictly to enhance atmospheric dispersion and gain dispersion credit that would allow an increase in emissions. As proposed, this project is defined as a "dispersion technique" under federal and state regulations. 40 CFR § 51.100(hh)(1)(iii); 9 VAC 5-10-20. Dispersion techniques are prohibited when establishing emissions limitations required for control of air pollution. 40 CFR § 51.118(a); 9 VAC 5-50-20.H. The only exception available to Mirant from this prohibition on dispersion credit is when the stack merging is a part of a change in operation that includes the installation of pollution controls and is accompanied by a net reduction in the allowable emissions of a pollutant. 40 CFR § 51.100(hh)(2)(ii)(B); 9 VAC 5-10-20. It is important to note that a mere reduction in emissions achieved by accepting a smaller limit on allowable emissions is not sufficient to claim dispersion credit for stack merger, i.e., installation of pollution controls is required for each pollutant for which credit is sought. The stack merging and the associated installation of pollution controls should be integrally related and contemporaneous. Any pollution controls that Mirant currently employs, including trona injection, were previously installed to meet other regulatory and compliance requirements. Therefore, the stack merger project as proposed by Mirant is a prohibited dispersion technique under federal and state law when determining emission limitations, and any such credit must be denied.

Consistent with EPA's well-settled policy regarding the prohibition of "double counting" of emission reductions, baseline emissions for PRGS should be defined as that demonstrated level of SO_2 emissions, prior to the proposed project, which was capable of complying with the SO_2 NAAQS. The PRGS's "allowable" emissions cannot be those defined by the existing SO_2 limit

in the EPA-approved SIP because that level of emissions has been documented as causing or contributing to NAAQS violations. It is axiomatic that emissions which violate the NAAQS cannot justifiably be classified as "allowable." Thus, even if no other activity were being contemplated at the PRGS, VDEQ is obligated to require PRGS to reduce its SO_2 emissions to a level that can be compliant with the NAAQS, i.e., a pre-stack merge proposal level of SO_2 emissions that will be allowable. Using that level as the baseline allowable, a net reduction in allowable emissions cannot occur if the proposed SOP allows emissions in excess of that properly defined baseline.

V. **Stack Merger Allows Increase in Short Term Emissions and Impacts**

Table below demonstrates how stack merger allows higher short term emissions when compared to five stack permit. Increasing emissions under guise of improving the impacts should not be acceptable in an area that is currently in non-attainment for PM2.5.

Increases in Three-hour and Daily Emissions Output That this Permit Allows for the Stack-Merged project

	SO_2- 3 hr.	SO_2 – 24 hr.	$PM_{2.5}$ – 24 hr.	PM_{10} – 24 hr.	NO_x
Existing Configuration (5 stack)	0.5 tons	12.0 tons	2.1 tons	2.1 tons	12.5 tons
Post-Modificaion (2 stack)	1.0 tons	22.4 tons	no limit.	1.9 tons	12.5 tons
Allowed Increase	1,000 lbs	10.4 tons	unlimited	--	--

These increases in daily emissions of PM $_{2.5}$ and in its precursor SO_2 emissions must be evaluated for their potential effect on air quality, in both the local and regional scales. There has been no demonstration within this proceeding that local or regional air quality will improve as a result of this physical modification/operational expansion project. Changes in daily emissions of PM $_{2.5}$ and its precursor emissions, even in the absence of annual changes in their emissions levels, will affect daily ambient levels of $PM_{2.5}$ because precursor conversion is affected by the meteorological conditions present when these pollutant increases occur. In the absence of limitations which confine the proposed daily direct PM $_{2.5}$ and precursor emission increases to only certain days of the year, then any regional and local-scale modeling analyses to predict the effect on maximum PM $_{2.5}$ 24-hour values must assume that these increases occur every day of the year (an Appendix W procedural requirement).

Note that any reduction between stipulated 24-hour limits for PM_{10} from the existing and post-modification configuration are not creditable emission reductions for the purpose of New Source Review because the short-term and annual limits for PM_{10} (and PM $_{2.5}$) for this proposed permit, and for the permit in the existing configuration, do not fully account for the particulate control systems to reduce PM_{10} to the maximum extent possible, which is a contravention of a statutory requirement.

VI. Impact of Increased Emissions on 5-min. SO_2 Concentrations

Alexandria previously raised concerns regarding the adverse health effects associated with peak 5-minute SO_2 concentrations resulting from Mirant PRGS's emissions. Given that the PRGS stacks are subject to downwash, and will continue to be subject to downwash after the stack merger, peak SO_2 impacts is a serious concern that has not been resolved to date. In 1996[9], U.S. EPA concluded that in some localized situations, 5-minute SO_2 concentrations above 0.60 ppm [1,570 $\mu g/m^3$] pose a health threat to sensitive individuals. The magnitude of health risk to the community is a function of the concentration and frequency of the peaks and size of the population subject to exposure.[10] Conversion of the facility's 1-hour or 3-hour SO_2 impacts to a corresponding 5-minute peak value reveals that the 0.60 ppm threshold is easily exceeded, even at levels well below the 3-hour NAAQS. For example, any 1-hour or 3-hour impacts that exceed approximately 900 or 800 $\mu g/m^3$, respectively, have the potential to exceed the 5-minute peak of 1,570 $\mu g/m^3$. Given that the proposed SOP allows the facility's impacts to approach the 3-hour NAAQS level of 1,300 $\mu g/m^3$, the 5-minute threshold is likely to be exceeded on a frequent basis. Furthermore, with the location of the PRGS within a densely populated area, the high level of exposure affects a large segment of Alexandria's residents. A combination of all of these factors at PRGS truly defines the magnitude of health risks contemplated by U.S. EPA in their 1996 ruling. This health risk is further compounded by the fact that the proposed two stack SOP allows increases in short term SO_2 emissions to levels much higher than the facility's current emissions or the emissions allowed under the proposed five stack SOP. Alexandria requests the SAPCB to perform a thorough evaluation of the peak 5-minute SO_2 impacts from PRGS and establish short term emission limits that mitigate the associated public health risk.

VII. Pollution Control Measures Must be Optimized

Regardless of the level of operations at the PRGS, the use of pollution control measures should be optimized to achieve sustainable maximum pollutant reductions. Virginia regulations require that "*[a]t all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions.*" 9 VAC 5-40-20.E. Although Condition 43 of the proposed SOP contains this regulatory language, the emission limits in the SOP fail to reflect this requirement.

SO_2 Control

Given the above regulatory requirement, no emission limits can be established that allow less than the optimum use of the trona control system. Therefore, even under scenarios where the plant can emit at greater levels without causing NAAQS violation, e.g., when it operates only one or two boilers, Mirant must use trona to minimize emissions to the extent practicable. The emission limits established in the permit must reflect this optimum use of the trona system. The

[9] Federal Register, May 22, 1996.
[10] U.S. EPA's draft Guideline Document for Ambient Monitoring of 5-minute SO_2 Concentrations, dated July 20, 2000.

lb/MMBtu limit for any operating scenario must reflect an upper limit that must be achieved by each boiler at all times of operation. This upper limit must be based on the capability of the trona system to maximize SO_2 reductions. Recent data from PRGS during trona use in 2006 and 2007 (see table below) shows that SO_2 emissions ranging from 0.15 to 0.25 lb/MMBtu are sustainable for extended periods. In addition, more recent data from the facility for operation under the current SOP issued on June 1, 2007 shows that the plant can consistently meet a limit of 0.30 lb/MMBtu, with an adequate margin of compliance. Therefore, the SOP should not permit SO_2 emissions in excess of 0.30 lb/MMBtu for any operating scenario. Condition 27 of the proposed SOP must be revised to reflect this limit, unless a lower limit is necessary for NAAQS compliance.

Additionally, given this plant's setting and proximity to residences, Condition 25 should be modified to only allow the combustion of ultra-low sulfur diesel oil in the boilers as an auxiliary fuel, i.e., oil with no greater than 0.05% sulfur. This limitation also serves to reduce particulate emissions from the boilers during oil combustion, e.g., during startup and idling conditions.

Reported SO_2 Emissions with Trona Use at Mirant PRGS

Month		Reported SO_2 Rate (lb/MMBtu) with Trona				
		Boiler 1	Boiler 2	Boiler 3	Boiler 4	Boiler 5
Feb 2006	Average	0.28	0.15	0.22	0.20	--
Mar 2006	Average	--	0.19	0.19	0.22	0.23
Apr 2006	Average	--	--	0.22	0.22	0.23
May 2006	Average	0.35	0.22	0.23	0.25	0.31
Jun 2006(1)	Average	0.22	0.35	0.44	0.42	0.34
Jul 2006(1)	Average	0.47	0.46	0.47	0.48	0.50
Aug 2006(1)	Average	0.47	0.48	0.48	0.48	0.51
Sep 2006(1)	Average	0.39	0.50	0.51	0.52	0.52
Oct 2006(1)	Average	0.40	0.44	0.45	0.48	0.49
Nov 2006(1)	Average	0.47	0.47	0.48	0.49	0.50
Dec 2006(1)	Average	0.54	0.46	0.49	0.52	0.67
Jan 2007(1)	Average	0.50	0.50	0.47	0.50	0.49
Feb 2007(1)	Average	0.53	0.48	0.49	0.48	0.50
Mar 2007(1)	Average	0.56	0.46	0.49	0.48	0.54
Month		**Reported 3-Hour SO_2 Rates (lb/MMBtu) with Trona**				
		Boiler 1	**Boiler 2**	**Boiler 3**	**Boiler 4**	**Boiler 5**
Jul 2007(2)	Minimum	0.16	0.04	--	--	0.16
Jul 2007(2)	Average	0.31	0.32	--	--	0.34
Jul 2007(2)	Maximum	0.45	0.52	--	--	0.53
Month		**Reported 24-Hour SO_2 Rates (lb/MMBtu) with Trona**				
		Boiler 1	**Boiler 2**	**Boiler 3**	**Boiler 4**	**Boiler 5**
Jul 2007(2)	Minimum	0.28	0.30	--	--	0.30
Jul 2007(2)	Average	0.31	0.33	--	--	0.34
Jul 2007(2)	Maximum	0.36	0.47	--	--	0.48

(1) Operation under the EPA's ACO issued in June 2006 that allowed SO_2 emissions to vary based on a prohibited dispersion technique, i.e., daily predictive modeling and forecasted meteorological data.

(2) Operation under the State Operating Permit issued by VDEQ on Jun 1, 2007.

Alexandria remains concerned regarding the potential health effects of trona. Based on a recent inconclusive review, Virginia Department of Health recommended that further studies be conducted. Alexandria requests that trona's health effects be assessed in a comprehensive manner as indicated by VDEQ in its July 26, 2006 letter to Alexandria. Furthermore, if Mirant selects an alternate sorbent instead of trona for future operations, a comprehensive study of that

sorbent must be conducted, and the optimum performance of that sorbent must be reflected in the emission limits.

Particulate Matter Control

The proposed SOP specifies a particulate matter emission limit of 0.045 lb/MMBtu and a PM_{10} limit of 0.03 lb/MMBtu for all boilers. The corresponding lb/hour and lb/day limits are based on this lb/MMBtu limit. These limits are about twice as high as the facility's stack test results of December 2006 and therefore do not reflect the optimum use of the Electrostatic Precipitators (ESPs). The following are the results from the December 2006 stack tests when trona was in use. Note that no limit is specified for $PM_{2.5}$ in the proposed SOP.

PM: 0.018 – 0.029 lb/MMBtu
PM_{10}: 0.014 – 0.016 lb/MMBtu
$PM_{2.5}$: 0.012 – 0.013 lb/MMBtu

Given the above results, the proposed emission limits would be arbitrary, provide an unusually high compliance margin, and may ultimately allow PRGS to increase emissions without appropriate regulatory review. Alexandria understands that the December 2006 stack test is not indicative of continuous ESP performance. However, a compliance margin of two to three times the actual performance is unreasonable. Instead, the PRGS must be required to optimize the ESP performance to minimize emissions at all times and the PM emission limits must reflect such performance.

Condition 14 of the proposed SOP requires a demonstration of ESP control efficiency necessary to meet the PM emission limits. Without adequate PM emission limits, Condition 14 is ineffective and meaningless because PRGS can achieve the prescribed emission limits at relatively low ESP control efficiencies.

Alexandria requests the SAPCB and VDEQ to revise Conditions 27 and 28 of the proposed SOP and specify pollutant-specific emission limits that reflect actual ESP performance for each pollutant, and recalculate the corresponding lb/hour and tons/year limits accordingly. Furthermore, $PM_{2.5}$ emission limits must also be specified that reflect ESP performance and that are NAAQS compliant.

NOx Control

The proposed SOP specifies a NOx emission limit of 0.32 lb/MMBtu for all boilers and the corresponding lb/hour limits are based on this lb/MMBtu limit. While all five boilers at PRGS employ low-NOx burners (LNB), the three base load units (Boilers 3, 4 and 5) also employ separated overfire air (SOFA) technology for additional NOx reduction. It is therefore unreasonable to specify an emission limit for Boilers 3, 4 and 5 that is the same as Boilers 1 and 2. The additional NOx reduction provided by SOFA, i.e., approximately 30 to 40%,[11] must be

[11] Mirant has claimed a 15% NOx reduction due to LNB on Boilers 3, 4 and 5, and 5 to 10% reduction due to LNB on Boilers 1 and 2 (presentation to MWAQC, 1/21/05, available at http://www.mwcog.org/uploads/committee-documents/olxeXFk20050121073747.pdf). EPA's Fact Sheet on the NOx Consent Decree claims 40 to 50% NOx reduction from

reflected in the emission limits. The PRGS must be required to optimize both the LNB and the SOFA technologies to minimize NOx emissions, and the emission limits must reflect their performance. Alexandria requests the SAPCB and VDEQ to revise Condition 27 of the proposed SOP to reflect a NOx limit of no more than about 0.22 lb/MMBtu from Boilers 3, 4 and 5, i.e., a limit still higher than what has been demonstrated for other pulverized coal-fired boilers retrofitted with LNB and SOFA technologies, such as the Texas Municipal Power Agency's Gibbons Creek plant.

VIII. Emission Limits are Arbitrary, Unreasonable and Excessively High

The proposed SOP specifies short term emission limits that are inconsistent with the annual limits. Furthermore, the emission limits are based on operational configurations that are unrealistic and without regard to the manner in which the PRGS actually operates. The emission limits in the SOP appear to be strictly based on levels that would demonstrate compliance with the NAAQS and assume that dispersion credit for stack merger is available to Mirant. While NAAQS compliance is essential for PRGS, sole reliance on such compliance is unreasonable in that it disregards the actual emissions achieved by the facility. In fact, several of the short term emission limits in the SOP are set so high that they are meaningless because PRGS does not emit at these levels and cannot achieve operational levels inherent in these limits. The following are examples of the arbitrary and unreasonable nature of the limits.

- The lb/hour limits for every pollutant appear to be based on a total of simultaneous operation of all five boilers at maximum load[12], with no limit on daily hours of operation. This is unrealistic because PRGS does not operate its boilers at full load for the entire day. This is especially true for the cycling units, i.e., Boilers 1 and 2. The boilers at PRGS routinely reduce load during night time due to lower electric demand.

- The lb/MMBtu limits do not reflect optimized use of the pollution control measures to minimize emissions. As discussed elsewhere in this letter, the actual emissions achieved at PRGS are considerably smaller than the limits in the SOP.

- The short term limits are set so high that the PRGS will quickly exceed its annual limits if it were allowed to emit at the hourly limits specified in the SOP on a daily basis. For example, the CO limit of 159.87 lb/hour allows only 112 days of operation before the annual limit is exceeded. Similarly, the PM_{10}, SO_2 and NOx limits of 159.87, 1,598.7 and 1,705.28 lb/hour allow only 196, 170 and 162 days of operation, respectively. The short term limits are therefore meaningless because Mirant cannot realistically emit at those levels without jeopardizing year-round operation.

- The tons/year limits for PM and PM_{10} are much higher than PRGS's current emissions. The proposed SOP appears to allow PRGS to increase emissions without review by the SAPCB and VDEQ.

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the combination of LNB and SOFA technologies (available at http://www.epa.gov/oecaerth/resources/cases/civil/caa/mirantfs.pdf).

[12] The total capacity reflected in the lb/hour limits is 5,329 MMBtu/hr, which is greater than the sum total of the capacities of the five boilers. This is an unrealistic scenario.

Alexandria requests the SAPCB and VDEQ to reduce the hourly in Condition 27 to reflect actual emissions and operations at the PRGS, with a reasonable margin of compliance. Similarly, the annual limits for particulate matter in Condition 28 of the SOP must be reduced to reflect actual performance of the facility.

IX. **CEMS for CO and PM Must be Required As Soon As Possible**

PM CEMS

Condition 18 of the proposed SOP specifies the requirement to develop a plan to install PM Continuous Emissions Monitoring System ("CEMS"). However, a period of twelve months is allowed to develop this plan with no commitment or schedule to actually install the CEMS. VDEQ seems to have ignored the fact that EPA promulgated the Performance Specification 11 ("PS-11") applicable to PM CEMS on January 12, 2004 (40 CFR 60, Appendix B) and finalized the Procedure 2 (40 CFR 60, Appendix F) for ongoing performance evaluations. EPA's PS-11 specifies the requirements for evaluating the acceptability of PM CEMS at the time of installation and requires site-specific correlation of the PM CEMS response against manual gravimetric Reference Method measurements. PS-11 also outlines the procedures and acceptance criteria for installation, operation, calculations, and reporting of data generated during a PM CEMS correlation. Several applications of PM CEMS have been certified using PS-11 criteria. Similarly, the Procedure 2 specifies ongoing operations requirements for the PM CEMS using a combination of daily calibration and quarterly audits. The daily calibration includes zero and upscale drift checks, as well as sample volume checks. Quarterly audits, required to be performed no less than two months apart, include Absolute Correlation Audits (ACA) and Sample Volume Audits (SVA). In lieu of an ACA, the facility may perform a Response Correlation Audit (RCA) or a Relative Response Audit (RRA). These installation and operational procedures are currently in place and have been in use for several years.

The table below presents a partial list of facilities that have installed and are currently operating PM CEMS for compliance purposes. As early as September 2000, EPA identified several manufacturers of PM CEMS in a report titled "Current Knowledge of Particulate Matter (PM) Continuous Emission Monitoring" (EPA-454/R-00-039) utilizing different technologies such as beta attenuation, light scattering, scintillation and electrostatic induction. Based on recent applications, Alexandria believes that beta attenuation and light scattering are the most developed methodologies.

Partial List of Sources Currently Using PM CEMS

Source	PM CEMS Installation Date	PM CEMS Technology
Tampa Electric – Big Bend Unit 4	Feb 2002	Beta Attenuation
Dominion Generation – Mt. Storm Units 1 & 2	Jul 2004	Beta Attenuation
We Energies - Oak Creek Units 5 & 6	Jan 2005	Beta Attenuation
We Energies - Pleasant Prairie Units 1 & 2	Sep 2006	Beta Attenuation
Western Kentucky Energy - Henderson Unit 2	Aug 2005	Beta Attenuation
Western Kentucky Energy - Henderson Unit 1	Feb 2007	Beta Attenuation
Kentucky Utilities Company - Ghent Station		Light Scatter
Kentucky Utilities Company - Mill Creek Station		Light Scatter
Minnkota Power Coop – M.R. Young Unit 2	Jul 2007	Beta Attenuation
DOE Oak Ridge TSCA Incinerator	Dec 2004	Beta Attenuation
Rayonier Pulp Mill - Recovery Boiler	Apr 2003	Beta Attenuation
Kennecott Utah Copper – Primary Smelter	Dec 2005	Beta Attenuation
Sunoco Refinery – FCCU/CO Boiler Stack	Apr 2007	Beta Attenuation

EPA identified the following manufacturers in its September 2000 report for the above two methodologies.

Beta Attenuation
- Durag
- Mechanical Systems, Inc.
- Environment S.A.

Light Scatter
- Sigrist
- Durag
- Environmental Systems Corporation
- Sick Maihak Inc.
- Grimm Technologies
- Monitor Labs

PM CEMS provide the most reliable data for compliance purposes on a continuous basis. Without PM CEMS, the only available data would be from periodic stack tests, which are not reliable for establishing continuous compliance. Based on the current experience with certified PM CEMS and given the availability of EPA's performance specification and quality assurance procedures, there is no reason to defer the installation of PM CEMS at PRGS. Alexandria requests the SAPCB and VDEQ to require the installation of PM CEMS as soon as possible, but no later than six months from the SOP issuance date.

CO CEMS

Condition 19 of the proposed SOP requires the installation of CEMS for monitoring CO emissions. However, the SOP allows PRGS to install them as a part of the stack merger project. The PRGS currently operates CO CEMS at the facility. Alexandria fails to see the rationale for allowing any additional time to meet this requirement. The CO CEMS at the facility must be calibrated and the performance evaluations must be conducted as soon as possible. Alexandria

requests the SAPCB and VDEQ to require the PRGS's CO CEMS to be calibrated and used for compliance purposes immediately.

Condition 19 of the SOP also allows PRGS to use data collected from the CO CEMS to increase their CO emissions limit. Mirant has known for several years that its CO emissions are greater than the approximately 250 ton/yr that it has reported in its past annual emissions statements. The CO emissions were further increased due to the installation of LNB and SOFA controls, without any review under NSR regulations. Now, the proposed SOP allows Mirant to increase its annual CO limit based on future data it will collect via CO continuous emissions monitors (CEMS). This is a circumvention of NSR regulations and must not be allowed.

X. Trona is Not a Particulate Matter Control

In its memorandum supporting the proposed two-stack SOP, VDEQ suggests that dispersion credit may be available to Mirant due to the use of trona. First, the trona injection system was installed over two years ago and is not a part of the stack merger project. Secondly, dry sorbent use is not a PM control measure for the boilers. On the contrary, dry sorbent use involves the injection of additional PM, thereby increasing the PM loading in the exhaust duct. Mirant uses as much as four (4) tons per hour of trona for each boiler to achieve the required level of sulfur dioxide control. This has a great potential for increasing PM emissions from the boilers, including PM_{10} and $PM_{2.5}$.

Alexandria has analyzed several months of opacity data from all five boilers at the PRGS. The data reflect actual in-stack Continuous Opacity Monitoring System (COMS) readings during operations both with and without the use of trona. The following table shows that in-stack opacity increased for every boiler due to the use of trona by as much as 110 percent. Given that opacity is an indicator of particulate matter emissions, especially fine particulate matter, Alexandria believes that trona contributes to PM emissions increases.

Average Stack Opacity With and Without Trona Use

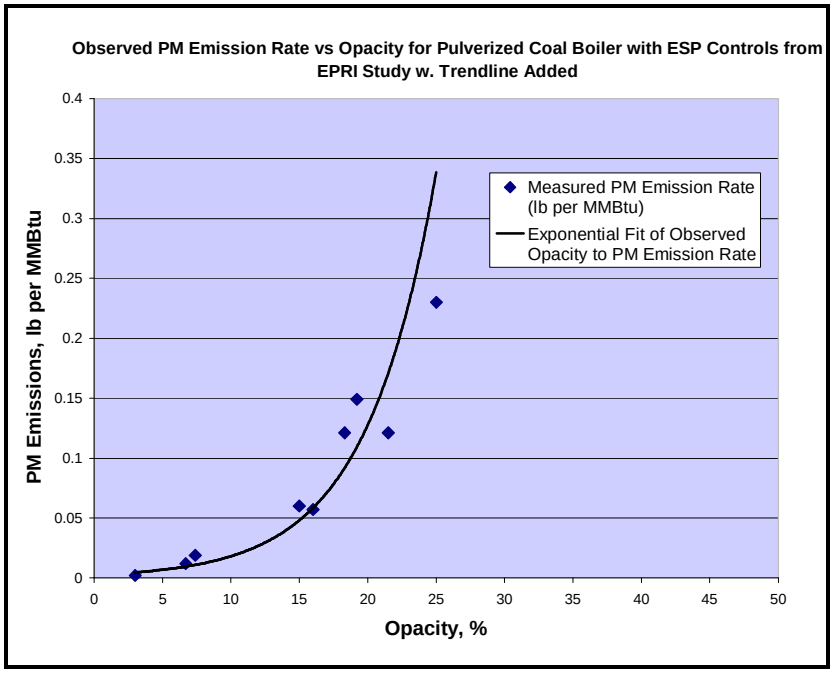
Boiler	Average Opacity(1)		% Increase in Opacity
	Pre-Trona (Jun-Aug 2005)	Post-Trona (Jun-Aug 2006)	
1	2.86	6.03	110.8%
2	4.16	6.76	62.5%
3	3.62	3.74	3.3%
4	2.61	3.10	18.7%
5	2.55	4.10	60.8%

(1) Based on a summary of 20,000 data points reported by Mirant for stack opacity, which is a surrogate for particulate matter emissions.

The figure below shows a curve fit between observed emission rates and opacity for testing of a pulverized coal boiler, obtained by Electric Power Research Interest Group, and reported by U.S. EPA.[13] These data clearly show that opacity positively correlates with PM emissions. Of particular concern to Alexandria is the fact that opacity is closely related to fine particulate

[13] "Current Knowledge of Particulate Matter (PM) Continuous Emission Monitoring," US EPA-454/R-00-039, September, 2000

matter in the size range of about 1 µm. Therefore, any increase in opacity is very likely related to increases in $PM_{2.5}$ emissions.



In response to Alexandria's recent request for data and analyses relating opacity increases to either increases or decreases in PM emissions, VDEQ wrote that it has "*determined that the information that you have requested cannot be found or does not exist in the records of the Department of Environmental Quality*" and that the VDEQ is "*not aware of another source of the information you requested.*" VDEQ also wrote that the "*Department is neither aware of nor in possession of the any documents, studies, or analyses relating the two or discussing the effect of increased opacity on emissions of total PM.*" Yet, VDEQ appears to agree with Mirant's claim that the December 2006 stack test demonstrated a reduction in PM emissions due to the use of trona. On the contrary, the December 2006 stack test is inadequate to make such a claim. First, the comparison of PM emissions with and without trona was only performed for one boiler that showed the smallest increase in opacity, i.e., Boiler 3. No other boiler was tested for this purpose. Second, the stack test reflects a one-time demonstration under controlled circumstances that are not representative of routine emissions. This is evidenced by the specified PM emission limit of 0.045 lb/MMBtu, i.e., a limit that is two to three times higher than the actual stack test results. Additionally, and perhaps most importantly, the stack test results without trona use are based on a dismal performance of the cold-side ESP (CSEP3), i.e., an average PM control efficiency of only 53%. Such low control efficiency represents faulty performance of CSEP3 and resulted in higher PM emissions during the tests when trona was not in use. In contrast, the CSEP3 control efficiencies during the tests with trona ranged from 89% to 94%, which are more representative of the actual capability of CSEP3. Therefore, while the stack test with trona may reflect accurate emissions from Boiler 3, a comparison of these emissions with the results without trona is flawed and cannot be used to claim PM reduction due to trona use.

Alexandria understands that Mirant has recently tested sodium bicarbonate as a possible alternate sorbent for SO_2 control. Alexandria's research shows that sodium carbonate as used for this purpose contains as much as 50% particles less than 12 microns in size, i.e., a much greater fraction than in the trona used at PRGS. Therefore, use of this sorbent has an even greater potential to increase PM_{10} and $PM_{2.5}$ emissions, and must be thoroughly analyzed via stack tests both with and without the sorbent and before and after ESP.

XI. **Health Effects of Trona Must be Studied**

VDEQ indicated in its July 26, 2006 letter to Alexandria that a comprehensive evaluation of health effects of trona will be performed. Virginia Department of Health recently completed an inconclusive review and recommended that further studies be conducted. Alexandria requests that trona's health effects be assessed in a comprehensive manner.

Of significant health concern to the residents of Alexandria is the presence silica in trona. The Material Safety Data Sheet ("MSDS") prepared by Solvay Chemicals, Inc., the supplier of trona used by the PRGS, indicates that trona contains up to 2 percent silica. Silica is a carcinogen and the State of California has determined that it is known to cause cancer. Furthermore, repeated exposure to respirable size particles of crystalline silica, the type of silica in trona, can cause adverse health effects such as silicosis, a progressive lung disease.

XII. **Alternate Sorbent Must Not be Pre-Authorized**

Based on VDEQ's inspection report on the PRGS facility dated October 4, 2007, Alexandria understands that Mirant is pursuing the testing of sodium bicarbonate for SO_2 emission control. While Alexandria is not opposed to an alternate sorbent, the City strongly believes that Mirant should notify and receive authorization from VDEQ and the SAPCB and that it should submit a detailed testing protocol for approval by VDEQ before the test. Specifically, this protocol should include: (i) characteristics of the tested sodium bicarbonate powder such as particle size analysis, amount required for the tests and associated handling method; (ii) duration of the testing and potential impacts on the environment and public health; (iii) PM_{10} and $PM_{2.5}$ stack tests to establish ESP performance with the use of sodium bicarbonate; and (iv) detailed set up of testing equipment. Alexandria further requests that the testing results be made available to the SAPCB, VDEQ, the City and the public.

If Mirant decides to replace trona with sodium bicarbonate on a permanent basis, a complete and thorough analysis regarding the impact on emissions and the facility's SOP must be completed prior to implementation. Since this replacement would be a change in the method of operation, Mirant must apply for a pre-construction permit prior to its use. For example, the use of sodium bicarbonate may allow PRGS to increase operations while meeting SO_2 emission limits, thereby increasing emissions of other pollutants such as NOx, CO, PM_{10} and $PM_{2.5}$. Without adequate review and a pre-construction permit, the proposed SOP must not be used to pre-authorize the use of any sorbent other than trona.

XIII. **Mercury Emission Limits Must be Specified**

The proposed SOP does not specify any mercury ("Hg") limits. Using the most recent 24 months of available data from October 2005 through September 2007, i.e., during the applicable baseline period, Alexandria performed the following calculation of Hg emissions based on the average actual heat input during this period.

Average Annual Heat Input	= 14,675,115 MMBtu/yr
Hg Emission Factor	= 2.53×10^{-6} lb/MMBtu (Mirant's TRI Report)
Annual Hg Emissions	= 37.1 lb/yr

Alexandria requests the SAPCB and VDEQ to specify the above Hg emissions as a limit in Condition 27 of the proposed SOP.

XIV. **The SOP Must be Practically Enforceable**

Virginia regulations require that the SOP must be enforceable as a practical matter. 9 VAC 5-80-850.F. The regulation requires the SOP to specify discrete emission standards (limits) and relevant conditions necessary to enforce these emission standards. To make the emission limits practically enforceable, VDEQ must specify the following as a minimum.

- Limits on production rates and raw material usage, i.e., hourly, daily and annual coal throughput or heat input rate, along with coal specifications. Condition 1 of the proposed SOP specifies the maximum rated capacities that are higher than the PRGS's current SOP dated June 1, 2007. VDEQ must explain the rationale for this increase in heat input rates. Also, while VDEQ states in the SOP that the rated capacities are for informational purposes only and do not form enforceable conditions, these capacities have been used to calculate the proposed emission limits. Therefore, Alexandria requests that the boiler capacities be made enforceable, along with adequate recordkeeping and reporting, to provide a practical way of limiting emissions. Similarly, the limit on the coal sulfur content in Condition 25 has been relaxed from a maximum value of 0.9% in the June 1, 2007 SOP up to a maximum of 1.2% and an average of 1.0% in the proposed SOP, without any rationale for this change. Higher sulfur content will require greater trona use to meet the SO_2 emission limits and will increase particulate matter emissions. Alexandria requests that the coal sulfur content be limited to a maximum value of 0.9%.

- Pollution control operating parameters and the minimum control efficiencies of all pollution controls, e.g., trona injection rate and percent SO_2 control, ESP operating parameters and percent $PM_{10}/PM_{2.5}$ control, LNB/SOFA operating parameters and percent NOx control, and the rate and frequency of water/surfactant application for fugitive dust control.

- Continuous emissions monitoring, e.g., in-stack CEMS for SO_2, NOx, PM and CO.

- Limits must be specified for the number of startups and shutdowns, and emissions during startup and shutdown must be quantified and modeled. This includes emissions generated during "idling" of boilers when no power is being produced. The SAPCB must ensure that any emissions during startup, shutdown and idling are subject to pollution control and abatement requirements at all times, and that sufficient logs are maintained to document the occurrence of these events.

- The initial stack testing requirement for PM_{10} and $PM_{2.5}$ in Condition 32 and the continued stack testing requirement on a limited basis in Condition 36 are inadequate to assure compliance. Alexandria recommends that stack tests for PM_{10} and $PM_{2.5}$ must be required every six months during the first two years. If the semi-annual results show continuous compliance, then the limited testing per Condition 36 can be implemented wherein either 2 or 3 boilers are tested every alternate year. Furthermore, $PM_{2.5}$ emission limits must be specified in the SOP so that the stack tests can be used for compliance purposes for this pollutant.

- The reporting requirements of the proposed SOP must be revised to require Mirant and/or VDEQ to make the PRGS's emissions and operational data available for review by the public without the need for a FOIA request. Alexandria recommends that PRGS's monitoring data, including stack test results, CEMS data, fuel records and ash handling data, be available to the public via Internet access such as a file transfer protocol ("ftp") website.

- Ironically, Conditions 21 and 23 of the proposed SOP stipulate significantly more stringent compliance assurance monitoring requirements on the silo baghouse than Conditions 14 and 22 set for the ESPs. The ESP's readings of secondary voltage and current should be relayed to the PRGS control room continuously. Daily readings are simply inadequate. All measurements should be averaged and recorded on a six-minute basis to allow correlation with opacity measurements.

XV. **VDEQ Must Complete NSR Analysis for the Past Projects**

VDEQ indicated in its letter to Alexandria dated July 26, 2006 that it was "*evaluating the applicability of NSR*" to the installation of trona injection and that it would "*complete this review and make appropriate recommendations relating to NSR prior to issuance of a draft State Operating Permit.*" No such analysis has been provided to date. However, given the proposed SOP for PRGS, Alexandria has reason to believe that VDEQ has completed its review of NSR applicability to trona injection, as well as to the installation of low-NOx burners (LNB) and separated overfire air (SOFA) technology, and requests VDEQ to share its findings. Using data available from the PRGS, Alexandria's analysis of these past projects indicates that major NSR was triggered and that PRGS should have applied for a received NSR permits. Under NSR regulations, PRGS must have applied Best Available Control Technology (BACT) and/or Lowest Achievable Emission Rate (LAER), as applicable to the pollutants in question, i.e., CO, PM_{10} and $PM_{2.5}$. For example, based on recent BACT/LAER determinations for coal-fired boilers, stringent emission limits of no more than 0.01 lb/MMBtu for PM and 0.20 lb/MMBtu for CO should be required. In addition, VDEQ's analysis shows that VOC emissions also increased

due to these projects and must have been reviewed at the least under Virginia's minor NSR regulations.

Mr. Richard Weeks of VDEQ wrote in a recent communication dated November 5, 2007 to Ms. Elizabeth Chimento, an Alexandria resident, that the NSR review "*was still in process in earlier 2007 but was overtaken by events. Once DEQ was directed by the State Air Pollution Control Board in April of 2007 to public notice a State Operating Permit with an annual limit for sulfur dioxide of 3813 tons, it was apparent that this cap on sulfur dioxide emissions along with the various operational limits imposed by the permit would make the new source review determination on TRONA moot. New source review is conducted to determine whether an activity should result in a permit requirement for new controls or emission limits because the activity is projected to cause a significant emissions increase in criteria pollutants above historic levels. The operational limits and stringent annual limit on emissions of sulfur dioxide imposed by the state operating permit effectively capped emissions from the facility to below historic levels such that no further action on new source review was necessary.*" This is a faulty argument in that the NSR is a pre-construction permitting program and a violation of the NSR regulations requires an enforcement action with commensurate penalties, and not a State Operating Permit. Nonetheless, the issuance of the SOP with an SO_2 limit of 3,813 tons/year on June 1, 2007 did not address any of the pollutants that triggered NSR due to trona installation, i.e., PM_{10}, $PM_{2.5}$ and CO. In fact, the currently proposed SOP allows PRGS to increase its PM_{10} and $PM_{2.5}$ emissions, unlike the stringent limits that would be required in an enforcement proceeding or in a BACT/LAER analysis of a major NSR permit. Therefore, the issuance of the SOP to PRGS does not render the NSR determination moot.

Alexandria requests VDEQ to share its findings of NSR determination on trona installation, as well as on LNB and SOFA installations, and urges the SAPCB to evaluate the proposed SOP limits in light of NSR violations by PRGS. At the least, the SOP limits should be established at levels no greater than the PRGS's actual emissions during the past 24 months, i.e., Fall 2005 through Fall 2007.

Once again, Alexandria appreciates the opportunity to provide these comments to the SAPCB and VDEQ on this important matter. Should you have any questions, please do not hesitate to contact William Skrabak at (703) 519-3400, ext. 163.

Sincerely,

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